57 ~~87.~~ (New) **The method of Claim 46, wherein said actuator is a control valve actuator for adjusting the flow of water through a heating coil.**

REMARKS

Applicants appreciate the time taken by the Examiner to review Applicants' present Application and respectfully request examination and favorable action in this case.

To advance prosecution of this case, Applicants address below the Examiner's rejections from the Official Action mailed May 21, 1999 as part of the prosecution of this continuation application's parent application, U.S. Patent Application Serial No. 08/932,652, filed on September 18, 1997.

This preliminary amendment also adds additional claims to more fully claim applicant's invention.

Rejections under 35 U.S.C. § 103(a)

The Examiner rejected Claims 1, 4, 15, 18, 19, 29, 32, 43, 45, 46, 48, 79, 82 and 86 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,928,840, issued to Nurczyk, in view of European Patent No. 0 248 380 issued to Heckenbach, U.S. Patent No. 5,251,124, issued to Matsunaga, and U.S. Patent No. 5,156,013, issued to Arima, et al.

NUMBERS DON'T MATCH

Applicants respectfully submit that neither Nurczyk, Heckenbach, Matsunaga, nor Arima teach, suggest, or make obvious the combination of a fuzzy logic controller, such as

that disclosed in Matsunaga or Arima, with a Variable Air Volume terminal, as disclosed in Nurczyk, and the plural pressure sensors of Heckenbach. Absent such suggestion, there would be no reason why one skilled in the art, faced with Applicants' problem of creating a simpler and more effectively operable Variable Air Volume("VAV") terminal controller and VAV system, and having no prior knowledge of Applicants' claimed structure, would consult the combination of references suggested by the Examiner.

Matsunaga discloses a fuzzy logic controller meant to improve fuzzy logic control of an object in a steady-state mode of operation, but does not teach or suggest the use of such a controller for a VAV system. Matsunaga, in fact, discloses an improved fuzzy logic controller, but does not disclose or suggest a particular use for such a controller. Similarly, Arima teaches the use of a fuzzy logic controller, but only for use with an absorption refrigerator. Applicants respectfully submit that it is not obvious or conventional to use a fuzzy logic controller, such as disclosed in Matsunaga or Arima, in a VAV system to implement a comparison of a setpoint and a measured variable to generate a control signal, such as a damper control signal. At least in the case of VAV systems, PID control algorithms are the prior art and it is not obvious to combine the above references to apply fuzzy logic control algorithms to VAV systems. One skilled in the art of VAV systems and their associated control methods would therefore not be likely to use either Matsunaga or Arima, alone or in combination with any other reference, including

Nurczyk or Heckenbach, to attempt to solve the problem solved by Applicants.

Applicants respectfully submit that for the reasons given above Claims 1, 15, 29, 43, and 46 meet the requirements of § 103(a). Claim 4 depends from Claim 1 and contains, by virtue of its dependency, all the limitations of Claim 1. Claims 18 and 19 depend from Claim 15, and contain, by virtue of their dependency, all the limitations of Claim 15. Claim 32 depends from Claim 29, and contains, by virtue of its dependency, all the limitations of Claim 29. Claims 45, 79, and 82 depend from Claim 43, and contain, by virtue of their dependency, all the limitations of Claim 43. Claims 48 and 86 depend from Claim 46, and contain, by virtue of their dependency, all the limitations of Claim 46. Accordingly, Applicants respectfully submit that Claims 4, 18, 19, 32, 45, 48, 79, 82 and 86 also meet the requirements of § 103(a). Applicants therefore respectfully request the Examiner to reconsider and withdraw the rejections and allow Claims 1, 4, 15, 18, 19, 29, 32, 43, 45, 46, 48, 79, 82 and 86.

The Examiner rejected Claims 3, 8, 17, 22, 31, 36 and 81 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,928,840, issued to Nurczyk, in view of European Patent No. 0 248 380 issued to Heckenbach, U.S. Patent No. 5,251,124, issued to Matsunaga, and U.S. Patent No. 5,156,013, issued to Arima, et al, and further in view of U.S. Patent No. 4,969,508, issued to Tate, et al, which shows remote and local control of an air terminal.

Claims 3 and 8 depend from Claim 1, and contain, by

virtue of their dependency, all the limitations of Claim 1. Claims 17 and 22 depend from Claim 15, and contain, by virtue of their dependency, all the limitations of Claim 15. Claims 31 and 36 depend from Claim 29, and contain, by virtue of their dependency, all the limitations of Claim 29. Claim 81 depends from Claim 43, and contains, by virtue of its dependency, all the limitations of Claim 43. For the same reasons as discussed above, Applicants respectfully submit that Claims 1, 15, 29, and 43 meet the requirements of § 103(a), and therefore Claims 3, 8, 17, 22, 31, 36 and 81 also meet the requirements of § 103(a).

Furthermore, Tate discloses a portable wireless remote control unit that allows a room occupant to control the environment in his or her individual room (col. 1, lines 53-68 and col. 3, line 53-col. 4, line 11). Applicants' invention, however, teaches a method for system-wide remote control of a VAV system using a high-speed, open protocol within a Local Operating Network (LON®) (page 7, lines 16-26, page 11, lines 9-12, and page 11, line 26-page 12, line 12). Applicants' invention, unlike Tate, is therefore capable of remote control through a network connection, as opposed to the handheld infrared wireless remote control of Tate. Even further, Applicants' invention allows remote control of the entire VAV system, and not just a single occupant's room. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw the rejections and allow Claims 3, 8, 17, 22, 31, 36 and 81.

The Examiner rejected Claims 5, 33, and 83 under 35

U.S.C. § 103(a) as being unpatentable over the art as applied to Claim 1 (see above) and further in view of Official notice "that it is well known to measure air flow by using a heated thermistor or an air turbine. . . " Applicants' respectfully submit that neither of Claims 5, 33, or 83 recite the limitation of using a heated thermistor or an air turbine to measure air flow. Furthermore, Claim 5 depends from Claim 1, and contains, by virtue of its dependency, all the limitations of Claim 1. Claim 33 depends from Claim 29, and contains, by virtue of its dependency, all the limitations of Claim 29. Claim 83 depends from Claim 43, and contains, by virtue of its dependency, all the limitations of Claim 43. For the same reasons as discussed above, Applicants respectfully submit that Claims 1, 29, and 43 meet the requirements of § 103(a), and therefore Claims 5, 33 and 83 also meet the requirements of § 103(a)

Rejections under 35 U.S.C. § 112

Claims 43-48, 80, 84, 85, and 87 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner states that "[t]he original disclosure does not support fuzzy logic control of liquid valves, hall effect circuitry (claim 84) and a shield for the flow sensor (claim 85)."

Applicants submit that Claims 43-48, 80, and 87 are

supported by the specification of the original case as filed. The original specification teaches a controller that can be used to control a VAV terminal. As part of controlling a VAV terminal that could be part of a VAV air conditioning system, or other environmental management system, the controller disclosed in the present Application can also control an auxiliary fan, first and second heaters, and a hot water coil flow control valve (page 13, lines 18-20, page 15, lines 4-7, and page 20, lines 3-17).

The control scheme disclosed in Applicants' present Application is intended ultimately to be used to control an air medium. However, to control the air medium, the control scheme also can be used to control alternative mediums, such as hot water in a coil, that directly affect the air medium. Even further, the ability to control an additional medium other than air, which in turn directly affects the air medium, is an integral embodiment of Applicants' invention.

In a VAV terminal controller embodiment, the controller disclosed by Applicants' can be used to control the temperatures in different parts of an environment by modulating the flow of air having a constant temperature. However, an integral part of controlling the flow of air includes the ability to maintain the desired air temperature to begin with. Controlling the temperature of the air by, for example, controlling the valve that controls the flow of hot water to a heating coil, is therefore not only within the scope of Applicants' invention as disclosed, but clearly an important feature of Applicants' invention.

Claims 84 and 85 are also supported by the specification of the original case as filed. The use of Hall Effect circuitry, in combination with a magnet, as recited in Claim 84, is supported by the specification as originally filed at page 46, lines 10-19. Similarly, the use of a shield surrounding the flow sensing circuitry, as recited in Claim 85, is supported by the specification at page 47, line 16-page 48, line 7.

Applicants therefore respectfully request the Examiner withdraw the rejections and allow Claims 43-48, 80, 84, 85, and 87.

CONCLUSION

Applicants appreciate the Examiner's efforts to review this case. Applicants have made an earnest attempt to place this case in condition for allowance and request continued examination and allowance of the Application. For the foregoing reasons and for other reasons clearly apparent, Applicants respectfully request full allowance of Claims 1, 3-5, 8, 15, 17-19, 22, 29, 31-33, 36, 43-48, and 70-78.

The Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 50-0456 of Gray Cary Ware & Freidenrich, LLP.

Respectfully submitted,

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